The State of New Hampshire
DEPARTMENT OF ENVIRONMENTAL SERVICES
Winnipesaukee River Basin Program
Franklin WWTP
528 River St. Franklin, NH 03235
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April 29, 2022

Mr. Justin Pimpare
EPA New England, Region 1
5 Post Office Square
Suite 100 – OEP 06-03
Boston, MA 02109-3912

Subject: 2021 WRBP Industrial Pretreatment Program Report

Mr. Pimpare:

In accordance with the requirements in **NPDES Permit No. NH0100960**, the Winnipesaukee River Basin Program (WRBP) is forwarding their annual report on the implementation of its Industrial Pretreatment Program for calendar year (CY) 2021.

If you have any questions regarding the report or its contents, please feel free to contact myself by phone at (603) 934-2809, or by email at Nicholas.d.Fontaine@des.nh.gov.

Best Regards,

Nicholas D. Fontaine
Industrial Pretreatment Coordinator
Winnipesaukee River Basin Program

cc: Sharon A. McMillin, PhD, Env. Program Administrator, NHDES-WRBP
Ray Gordon, Administrator, NHDES-WRBP
Alex Rastorguyeff, NHDES-WWEB
File

EPA Region 1 Annual Pretreatment Report Summary Sheet
April 2021

POTW Name: Winnipesaukee River Basin Program

NPDES Permit: NH0100960

Pretreatment Report Period Start Date: January 1st, 2021

Pretreatment Report Period End Date: December 31st, 2021

# of Significant Industrial Users (SIUs): 18

# of SIUs Without Control Mechanisms: 0

# of SIUs not Inspected: 0

# of SIUs not Sampled: 2

# of SIUs in Significant Noncompliance (SNC) with Pretreatment Standards: 1

# of SIUs in SNC with Reporting Requirements: 0

# of SIUs in SNC with Pretreatment Compliance Schedule: 0

# of SIUs in SNC Published in Newspaper: 1

# of SIUs with Compliance Schedules: 0

# of Violation Notices Issued to SIUs: 1

# of Administrative Orders Issued to SIUs: 0

# of Civil Suits Filed Against SIUs: 0

# of Criminal Suits Filed Against SIUs: 0

# of Categorical Industrial Users 10

(CIUs): *Smiths Tubular Systems (2 Facilities), Cooper Products, Freudenberg NOK, PCC Structurals (2 facilities), NH Ball Bearings, Aavid Thermalloy, Vitex Extrusions, Spinnaker Contract Manufacturing.*

# of CIUs in SNC: 1

Penalties

Total Dollar Amount of Penalties Collected $ 0.00

# of IUs from which Penalties have been collected: 0

Local Limits

Date of Most Recent Technical Evaluation of Local Limits: 4/28/2017

Date of Most Recent Adoption of Technically Based Local Limits: 4/28/2017

Pollutant	Limit (mg/l)	MAHL (lb/day)
Aluminum	125	-
Arsenic	0.23	0.62
Cadmium	0.03	0.53
Chloride	9100	-
Chromium	3.30	12.91
Copper	1.40	10.79
Cyanide	0.45	3.75
Iron	25.0	-
Lead	0.85	2.69
Manganese	5.00	-
Mercury	0.025	0.14
Molybdenum	0.38	0.94
Nickel	1.00	6.43
Selenium	0.18	0.45
Silver	0.40	0.81
Zinc	5.85	22.09

Local limits as referenced in Env-Wq 1203.12 "Prohibited Discharges"

2021

INDUSTRIAL PRETREATMENT PROGRAM ANNUAL REPORT

WINNIPESAUKEE RIVER BASIN PROGRAM
FRANKLIN WASTEWATER TREATMENT FACILITY
NPDES PERMIT No. NH0100960

April 29, 2022

528 River Street
P.O. Box 68
Franklin, NH 03235

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INTRODUCTION

The New Hampshire Department of Environmental Services' (NHDES) Winnipesaukee River Basin Program (WRBP) is a 11.5 MGD activated sludge wastewater treatment facility (WWTF) with anaerobic digestion and UV disinfection. This facility and its staff serve 10 New Hampshire Lakes Region communities consisting of Franklin, Tilton, Northfield, Sanbornton, Belmont, Laconia, Gilford, Meredith, Center Harbor, and Moultonborough.

According to the WRBP's National Pollutant Discharge Elimination System (NPDES) permit requirements as outlined in NPDES Permit No. NH0100960 ("NPDES Permit"), the WRBP must implement an industrial pretreatment program (IPP) and annually submit a summary report regarding the implementation of this program. The following report describes the WRBP's IPP activities in calendar year (CY) 2021. The report format as described in 'Attachment D' of the NPDES Permit was used as a guide for this annual report.

SECTION 1: STATUS OF THE WRBP'S IPP

The goal of the WRBP's IPP is to ensure that wastewater discharges from industrial or commercial businesses to the WRBP collection system do not endanger WRBP employees, damage WRBP facilities, or interfere with treatment processes that may contaminate biosolids, and/or adversely impact the water quality of the Merrimack River. The WRBP's IPP believes it continues to be effectively fulfilling the responsibilities it has, to protect human health and the environment. The status of the WRBP's IPP during CY 2021 is as follows:

IPP/Laboratory Staffing and Roles

In CY 2021, staffing of the WRBP's IPP consisted of two full time employees through July, the Industrial Pretreatment Coordinator (Nicholas Fontaine) and Engineering Technician (Cory Smith). In August of 2021, the vacant Laboratory Scientist position was filled by Daniel Demers. The Industrial Pretreatment Coordinator and Engineering Technician conducted surveillance, inspection, and sampling activities at permitted industries. In-house laboratory work was conducted by the Engineering Technician, the Lab Scientist, and several operators. The data collected was reviewed daily by the Industrial Pretreatment Coordinator, the Chief Operator (Mark Corliss), and Laboratory Scientist (Dan Demers) to identify if any interferences and/or if pass-through had occurred. Quarterly sampling was conducted by IPP staff to support and develop defensible local limits and to determine if there was a need to investigate any potential plant loadings resulting from recycled plant waste streams or incoming wastes from other sources.

The current organizational chart of the WRBP's IPP section will continue to be reviewed and updated to maintain adequate staffing, maximize the program's "bandwidth," and to ensure exceptional implementation of the pretreatment program.

Commercial Discharge Permit Initiative

In 2005, the WRBP started permitting *new* commercial facilities whose discharges did not meet the definition of a Significant Industrial User (SIU). The WRBP would eventually update its Env-Wq 1200 Rules to include the permitting of these commercial discharges. An educational Commercial Discharge Permit

(CDP) initiative was started in 2017 to provide control mechanisms for *all* current commercial users and to further develop a discharge tracking program for the collection system. The WRBP has continued the CDP Initiative during 2021, working with the member communities and prioritizing the permitting of food service establishments, dental offices, as well as registered NH Hazardous Waste Generator Facilities. From Quarter 4 of 2018 through Quarter 4 of 2021, 181 commercial facilities were permitted—42 of which came in 2021. A total of 265 CDP's have been issued from January 2005 to December 2021. The commercial discharge permit program is on a three-year self-reporting cycle to track changes in ownership and/or processes.

The CDP initiative has an ongoing three-phased approached:

1. The first phase of this initiative is to permit and educate commercial users on the WRBP's role in the community; the impact pollutants can have on the wastewater treatment facility; best management practices for disposal of certain wastewaters and any accumulated solids and sludges; as well as any applicable rules outlined in Env-Wq 1200 and/or the member community's sewer use ordinance. This is conducted in person, by letter, email, and/or phone correspondence.

2. The second phase is to perform in person facility surveys to ensure compliance with the applicable rules. Outreach is provided to facilities that have been determined to still be in non-compliance.

3. The third phase then to inspect, compare the results of these inspections to the surveys, and then enforce these rules to deter recalcitrant commercial facilities from continuing discharge violations.

The goal of this initiative is to implement a robust tracking program which can be used by both WRBP and member community personnel to monitor and investigate potential upstream slug loadings resulting from commercial facility operations.

Dental Program

Per Env-Wq 1200, the WRBP considers dental facilities to be commercial dischargers. The WRBP has identified and permitted a total of twenty (20) dental facilities that discharge to the sewer collection system. In CY 2021, all twenty (20) facilities were inspected and were confirmed to have an amalgam separator. Additionally, it was confirmed that the federal requirement of a "one time compliance report" had been submitted for all twenty (20) facilities. The WRBP is planning to inspect dental offices at a frequency of 1/year to ensure amalgam separators are being maintained within manufacturers specifications.

The WRBP and Per- and Polyfluoroalkyl Substances (PFAS)

In response to the environmental and human health concerns associated with PFAS, the WRBP has been tracking the loading of 17 PFAS compounds through the activated sludge wastewater treatment processes. In addition to PFAS sampling at the plant, key permitted SIUs agreed to PFAS testing in 2021. A total of ten (10) facilities were sampled for 17 PFAS compounds in 2021.

The WRBP is planning on sampling key locations in its collection system to identify PFAS "hotspots" that are contributing to the concentrations found throughout the WWTF. Once these "hotspots" are identified, the WRBP will provide education and outreach to these sources. Collection system sampling will be

conducted during the summer of 2022.

Training Activities for the WRBP Staff

In 2021, the Engineering Technician, Lab Scientist, and Industrial Pretreatment Coordinator attended the 2021 Annual New England Region Pretreatment Coordinators Association ("NERPCA") virtual conference. Staff also took advantage of the webinars hosted by the EPA, NEWEA, NEWMOA, John R. Harrison Consulting, RCAP, as well as other firms, during CY 2021.

Currently, the Industrial Pretreatment coordinator holds a New Hampshire Wastewater Operator IV-OIT license. The Engineering Technician and Lab Scientist are planning on obtaining their operator licenses within the next year.

Pollution Prevention

The New Hampshire Pollution Prevention Program (NHPPP) was created to incorporate pollution prevention as the preferred option for meeting established environmental quality goals. In the past, the NHPPP has proven to be a valuable resource, providing outreach and technical assistance to industries and small businesses on how they can address minor deficiencies or obtain appropriate permits; often without incurring the cost of engaging a consultant or engineer. The NHPPP has especially been helpfully in recent years by helping the WRBP relay information to our small batch breweries over the concerns of high strength "waste beer" discharges.

Annual Self Audit and Program QA/QC

The WRBP laboratory and IPP performs an annual self-audit as part of the NHDES Quality Management Program. The laboratory reviews data and protocols and submits audit results to the QA team which meets at the NHDES Office located at Hazen Drive in Concord, NH. Results are reviewed by the QA team and any recommendations are noted. An internal self-audit was submitted to NHDES on March 31, 2022.

SECTION 2: INDUSTRIAL USERS AND COMPLIANCE STATUS

The industries identified as Significant Industrial Users (SIU), as promulgated in 40 CFR 403.3 (v), are listed as either Categorical Industrial Users (CIU) or Non-Categorical Industrial Users in this report. The WRBP defines an SIU by one or more of the following criteria:

1. All industrial users subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N.

2. Any industrial user that: Discharges more than 25,000 gallons per day of process wastewater; contributes a process waste stream which makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the WRBP by considering such factors as: pollutants being introduced that are not amenable to treatment or reduction by the processes employed at the POTW, spill potential, potential to (a) cause the POTW to violate its NPDES permit, (b) adversely affect the treatment process or sludge use and/or disposal, and (c) violate any pretreatment standards or requirements.

Any non-categorical industrial user meeting the criteria in (2) may petition the WRBP to not be considered

a significant industrial user. The company shall be required to be monitored and permitted for a minimum of two years. If, after the two-year period, the industrial user has met all of the pretreatment requirements and standards and has no reasonable potential to adversely affect our operation or violate any local, state or federal regulations, the WRBP may de-list the industrial as an SIU. Additionally, in response to the IPP compliance audit findings report dated October 12th, 2018, the WRBP had modified its CIU permits to clarify that industrial users subject to categorical pretreatment standards have the option to seek a monitoring waiver in accordance with 40 CFR 403.12(e)(2) by submitting a written request to the WRBP for a permit modification.

Inspections are conducted by IPP staff on all industrial users at a frequency of no less than once per year. Over the past few years, joint inspections involving the New Hampshire Department of Environmental Services' Hazardous Waste Management Bureau and WRBP IPP personnel have occurred. This has helped to consolidate inspections and potential enforcement actions and has helped the WRBP IPP gain a more holistic understanding of the permitted industries in its service area.

An industrial contact email chain was established in 2019 and continued into 2022 to better communicate with the permitted industries. Through this mechanism, quarterly reminders are being sent out regarding due dates for reports and sampling requirements. The WRBP believes that education and outreach along with availability, shown through these periodic email reminders, will reduce the occurrence of Significant Noncompliance (SNC) and prevent discharges that may interfere or damage WRBP facilities, human health and/or the environment.

All 18 permitted Industrial Users were inspected by the WRBP IPP in 2021. Samples were not collected at two (2) facilities (Vitex Extrusions, LLC. and Cooper Products, Inc.), as these facilities did not have a discharge during CY 2021.

No new Industrial facilities were permitted in 2021, however there was one permit modification request submitted by New Hampshire Ball Bearings, Inc. (NHBB) in March of 2021 for a request to discharge "oily process" wastewater into a new pretreatment system. This wastewater has yet to be discharged as oil and grease concentrations (via EPA Method 1664 revision B, Hexane Extractable Material (HEM)) have exceeded the local limit of 50 mg/L. The WRBP and NHBB have been working together to tweak the system to ensure that permit requirements will be met. The discharge of this waste stream is anticipated to occur sometime in spring of 2022.

All SIUs currently holding a WRBP permit are listed on **Table I: Categorical Industrial User Overview** and **Table I-A: Non-Categorical Industrial User Overview.** On **Table II: Categorical Industrial User Compliance Status** and **Table II-A: Non-Categorical Industrial User Compliance Status** the compliance status for each SIU is listed.

Compliance and enforcement information for each SIU is found on **Table III: Categorical Industrial User Compliance and Enforcement** and **Table III-A: Non-Categorical Industrial User Compliance and Enforcement**. This sheet provides inspection dates, sampling dates, and the number of informal enforcements letters issued.

In 2021, the following were issued: (0) Letters of Deficiency ("LOD"); (0) Administrative Fines ("AF"); and (1) Notice of Past Violation ("NPV"). There was (1) SIU published for significant non-compliance ("SNC") in 2021.

SECTION 3: SUMMARY OF ANALYTICAL TESTING

This section summarizes the WRBP's comprehensive efforts in identifying the pollutants of concern following the protocols found in EPA's "Local Limits Development Guidance" (July, 2004). All samples collected were flow proportional, 24-hour composites. The following list identifies each sample and the corresponding Table outlining the results for the CY 2021 monitoring period.

Sample Location	Sample Description	Table
Headworks	Flow Proportional, based off Influent Flow Meter, located upstream of the bar racks in the headworks building	Table IV-A
Influent	Flow Proportional, based off Influent Flow Meter, located upstream of the bar racks in the headworks building	Table IV-B
Primary Influent	Flow Proportional, based off Influent Flow Meter, located upstream of the bar racks in the headworks building. Also Includes recirculation flows from thickener overflows, the in-house domestic, and centrate flows.	Table IV-C
Primary Effluent	Flow Proportional, based off Influent Flow Meter located upstream of the bar racks in the headworks building. Also Includes recirculation flows from thickener overflows, the in-house domestic, and centrate flows.	Table IV-D
Effluent	Flow Proportional, based off Effluent Flow Meter located upstream of UV Building	Table IV-E and Table IV-F
Biosolids	Composite of eight grab samples collected 5-minutes apart, directly from the centrifuge, as it falls into the roll-off container.	Table IV-H and Table IV-I

The Headworks monitoring results, as shown in **Table IV-A: CY 2021 Quarterly Headworks Monitoring Results** , are compared to the minimum threshold inhibition levels of the activated sludge process (shown as Maximum Allowable Headworks Loading or MAHWL[(1)] (in mg/l)) and the following plant/environmental criteria (shown as MAHWL[(2)] (in lbs./day) for each criteria): Activated Sludge Threshold Inhibition (A.S.); Water Quality, Chronic Criteria of the receiving stream(W.Q.); Digester Threshold Inhibition (D.I.); and Land Application, Biosolids Quality (L.A.). The limiting criterion for each pollutant monitored is shown in boldface. For nine of the 12 pollutants, the limiting condition is the Land Application criteria.

The MAHWL[(2)] levels (lbs./day) are the values derived from an applicable criterion or standard during the development of local limits. These MAHWL[(2)] levels were calculated using EPA's minimum inhibition threshold values for the Activated Sludge process in the local limit equation. Local limit equations do not account for the pollutants from internal plant waste streams (*e.g.* sludge digesters or gravity thickeners supernatant recycle streams). These minimum inhibition threshold values are utilized to ensure that the biological treatment system can accommodate these internal sources of pollutants without adverse effects. Because the WRBP has chosen to use minimum inhibition threshold values in the development of headworks loadings, the WRBP believes it is reasonable to assume that the biological treatment system can handle pollutant concentrations above these calculated minimum levels.

In **Table IV-A**, the Headworks results reveal no exceedance in either of the A.S. inhibition threshold concentrations or calculated allowable headwork's loading for the Land Application criteria. When comparing the results shown in **Table IV-B: CY 2021 Influent Monitoring Results**, **Table IV-C: CY 2021**

Primary Influent Monitoring Results, and **Table IV-D: CY 2021 Primary Effluent Monitoring Results** to the A.S. inhibition threshold concentrations, all results are well below the minimum inhibition values.

In **Table IV-E: CY 2021 Quarterly Effluent Monitoring Results**, effluent data is compared to the maximum effluent levels allowed (shown as WQC1 Max and WQC2 Max) for the plant to discharge into the river and not exceed the state's water quality standards. These standards, for both chronic and acute toxicity, are based on an assumption of 7Q10 (the lowest 7-day average flow that occurs on average once every 10 years) conditions of the Merrimack River. The WQC values were derived using chronic values (the more stringent set of criteria) and are shown in the table for comparison with actual effluent concentrations (with the exception of arsenic and silver which are based on human health criteria). Adjustments for hardness and dissolved vs. total metal concentrations were applied and can be viewed on, **Table IV-G**: **CY 2021 Effluent Concentration Limit Calculations**. The "WQC1 Max." value is the calculated maximum allowable pollutant concentration in the effluent at the average plant flow (6.376 MGD in 2021) and the "WQC2 Max." value is the maximum allowable pollutant concentration in the effluent at the design plant flow of 11.5 MGD. Both calculations assume a background level in the river of zero (0) mg/l for each pollutant.

Whole Effluent Toxicity (WET) samples were collected and analyzed during the months of January, April, July, and November as part of our NPDES permit bio-monitoring requirements. A summary of the WET results may be found on **Table IV-F**: **CY 2021 Summary of WRBP Effluent Toxicity Testing**.

The CY 2021 biosolids test results are shown in **Table IV-H: CY 2021 Biosolids Metals Monitoring Results** and **Table IV-I: CY 2021 Biosolids Non-Metals Monitoring Results**. The pollutants monitored included the inorganic pollutants regulated for land application by the federal (40 CFR 503) rules and the New Hampshire Sludge Management Rules (Env-Wq 800). All produced biosolids in CY 2021 were transported via Normandeau Trucking, Inc. to the Town of Merrimack's Wastewater Treatment/Composting Facility located at 36 Mast Road Merrimack, NH where WRBP biosolids are composted into a Class A biosolid commercial product. The total biosolid production for CY 2021 can be found on **Table IV-J: Annual Biosolids Production Yield**. The WRBP continues to maintain its New Hampshire Sludge Quality Certification (NHSQC-9706) per the Memorandum of Agreement between the Town of Merrimack and the WRBP.

The WRBP is tracking 17 Per- and Polyfluoroalkyl Substances (PFAS) through the activated sludge wastewater treatment processes using grab samples. **Table V-A** is the analytical summary of PFAS concentrations at various wastewater locations at the WWTF, whereas **Table V-B** documents PFAS concentrations within WRBP's sludge and biosolids.

In 2021 the WRBP sampled 10 Industrial facilities for the same 17 PFAS monitored at the plant. **Table V-C:** summarizes the industrial user results.

SECTION 4: DESCRIPTION OF INTERFERENCE AND PASS-THROUGH MONITORING

Daily laboratory process control and NPDES compliance testing provides the WRBP with an understanding of the wastewater constituents the treatment plant is handling and their impact on the treatment process and receiving stream. This data is essential for treatment plant operation and assessment of the effluent's impact on the water quality of the Merrimack River. To provide an early warning of a potential

interference problem (e.g. high or low pH) entering the WWTF or pump stations, the WRBP also utilizes real-time pH recorders. These pH recorders are monitored 24 hours per day, through a Supervisory Control and Data Acquisition (SCADA) system, and are installed at the following locations:

- The Winnisquam pump station, which is a major lift station located in Laconia, handling approximately 60% of the flow to the WWTF;
- The River Street pump station in Franklin, which handles approximately 15% of the flow to the treatment plant; and
- The influent at the treatment facility's headworks.
- The effluent at the "Old Plant Water Building."

Other active programs employed to monitor for pass-through and interference include the following:

- Quarterly monitoring of the headworks, influent, primary influent, primary effluent and effluent locations for metals;
- Quarterly Whole Effluent Toxicity testing;
- Quarterly monitoring of biosolids for metals and non-metals; and
- Continuous monitoring for hazardous gases and oxygen levels whenever employees enter confined spaces or other areas with potential atmospheric hazards for inspection and maintenance.

In CY 2021, five (5) potential interference problems were identified:

1. **February 2021 Laconia Fuel Oil Spill**

   On February 5th, 2021, the City of Laconia notified the WRBP of a strong petroleum odor located at the City of Laconia's Lawrence Ct. Pump Station. The odor was consistent with that of #2 Fuel Oil. It was determined that the oil was contained at the Laconia-owned pump station and did not make it downstream to WRBP facilities. It was believed the source was home heating oil originating from a maintenance/boiler room floor drain or sump and was limited to several manholes upstream from the pump station. The WRBP and City of Laconia conducted a thorough upstream investigation to identify the source, however, no source was identified. Laconia would go on to pump out and dispose of 1,100 gallons of oily wastewater out of their Lawrence Ct. Pump Station wet well.

2. **March 2021 Low pH Slugs**

   On March 9th, 11th and 13th, 2021 three low pH slugs were observed at the Winnisquam Pump Station. Each slug was monitored below 5.5 *s.u*. Approximately 9 hours later, each slug was monitored at the WWTF's continuous influent pH recorder where there was enough dilution to raise the pH above 6.0 *s.u.* in all three incidents. Industrial data was reviewed, but a source could

not be identified.

3. **April 2021 High pH Slug**

   On April 22, 2021, a high pH slug was monitored at the Winnisquam Pump Station. WRBP personnel observed a citrous smelling aroma, in the Winnisquam wet well. Approximately 9 hours later a very small pH flux was observed at the WWTF's influent pH recorder. WRBP staff believe this occurrence was from a facility that was using cleaning chemicals. Function halls and schools located upstream of Winnisquam Pump Station were targeted as a response, however the source was not identified.

4. **November 2021 High pH Slug**

   On November 16th, 2021, a high pH was recorded at the Winnisquam Pump Station. No alarm rang out for this incident, as the pH was recorded below the 9.5 *s.u.* high alarm set point. Approximately 9 hours later, a pH flux was observed at the WWTF's influent pH recorder (7.46 *s.u.*). Although the discharge was not recorded above the 9.5 *s.u*. discharge limit, it was expected that this slug was discharged above the limit with the assumption that a significant amount of dilution would occur. Data from upstream industrial sources was reviewed, no source was identified for this occurrence.

5. **November 2021 Blue Influent**

   On November 24th, 2021, WRBP personnel observed a glacial blue color in the grit chambers. Since no pH flux was observed at the influent, no odor was present, and copper concentrations in the sludge and wastewater were not elevated, it was suspected that this was a water-based blue dye, possibly a concentrated "blue pond dye" waste product or from the draining of a small pond. WRBP personnel reached out to multiple mini golf courses in the area to see if they discharged their ponds to the sewer, however the source could not be confirmed.

Due to the increase in pH slugs, the WRBP had purchased two mobile pH recorders in 2021. This will give the WRBP the ability to strategically place pH recorders upstream of the Winnisquam Pump station to help narrow down upstream sources for similar slug incidents. The WRBP does not believe that all incidents in 2021 originated from the same source and are continuously investigating all incidents. All upstream industrial sources with pH recorders, have been ruled out.

Based on the data collected and routine observations (*e.g.* surface appearance of clarifiers, amount and color of foam in aeration tanks, and odors at each plant process) by the operators of the WRBP's treatment facility and pumping stations, the WRBP can report to the best of its knowledge that there were no interferences or pass-through at the treatment plant in 2021.

SECTION 5: SEWER USE RULES AND LOCAL LIMITS UPDATE

The current NPDES permit, effective on January 1st, 2017, required the WRBP to review local limits and the IPP program, updating each as necessary. On April 28th, 2017, the WRBP submitted a review to the EPA and DES regarding our analysis of the technically based local limits ("TBLL"). They proposed no revisions to the TBLL. If not when the TBLLs are determined to be insufficient, the WRBP will undertake

any necessary modifications to our Rules through the legislative process.

On March 19th, 2019, the WRBP re-adopted its Env-Wq 1200 Rules with amendments. Based upon the 2018 IPP audit finding, the WRBP modified its Env-Wq 1200 Rules to allow industrial users subject to categorical pretreatment standards the option to seek a monitoring waiver in accordance with 40 CFR 403.12(e)(2) by submitting a written request to the WRBP for a permit modification. Other modifications clarified and strengthened the permitting, enforcement, monitoring, and waiver activities of the IPP Program. Since no revisions to the TBLL were proposed in 2017 and EPA has not recommended any changes, the local limits remained unchanged in the re-adopted Rules.

The WRBP's NPDES permit is currently in the reapplication process. The TBLL will be reassessed within 90 days of NPDES permit reissuance. Any modifications to Env-Wq 1200 will be submitted to the EPA for review.

Table I: Categorical Industrial User Overview

Company Name	Address	Permit #	CY21 Change	Product	Limits (Y/N)		Pretreatment	Permitted Flow (gpd)	Comments
			Add, Delete, Modify		Cat.	Loc.			
Smiths Tubular System Laconia Inc. dba Titeflex Aerospace	93 Lexington Drive Laconia, NH 03246	IDP 001		Precision Stainless steel Tube Bending & Fabrication	40 CFR 433.15	Y	Elementary Neutralization System, Ag Recovery (X-ray), Ultrafiltration (FPI)	25,000	ECM Rinseate Going to ENS. Bypass RO System Since F002 HW listing of Filters.
Smiths Tubular System Laconia Inc. dba Titeflex Aerospace	144 Lexington Drive Laconia, NH 03246	IDP 002		Precision Stainless steel Tube Bending & Fabrication	40 CFR 433.15	Y	Elementary Neutralization System	14,400	NA
Cooper Products, Inc.	210 Fair Street Laconia, NH 03246	IDP 005		Molded Gaskets & Seals	40 CFR 433.15	Y	pH Adjustment	300	Batch Discharger (No More than Two (2) 300-Gallon Discharges per Month
Freudenberg NOK Sealing Technologies	6 Axle Drive Northfield, NH 03276	IDP 006		Molded Rubber Parts	40 CFR 428	Y	None	2,500	Limited Flow from Ultrasonic Wash System in 2021
PCC Structurals Inc.	35 Industrial Park Drive Franklin, NH 03235	IDP 007		Aluminum Investment Casting	40 CFR 433.15	Y	**T-28-**Ultrafiltration/GAC (FPI), Ag Recovery (X-Ray) **T-95-** Elementary Neutralization System	17,500	Monthly Reporting Requirement. Installed a New O/W Separator in June of 2020
New Hampshire Ball Bearings Inc.	155 Lexington Drive Laconia, NH 03246	IDP 008	M	Spherical Rods & Bearings	40 CFR 433.15	Y	**New:** O/W separation	5,000	Tumble WW not Pretreated. New O/W Separator Online Spring 2022. Tot. Flows to be Less than 5,000 gpd
Aavid Thermalloy LLC.	1 Aavid Circle laconia, NH 03246	IDP 009		Anodized Aluminum Heat Sinks	40 CFR 433.15	Y	Chromium Reduction, Aluminum Precipitation, Cyanide Reduction, ENS, Ultrafiltration	80,000	Added a Photochemical Etch Wastewater Discharge to Existing Central WWTS in 2020
PCC Structurals Inc.	24 Granite Street Northfield, NH 03276	IDP 010		Aluminum Investment Casting	40 CFR 464.15(f)	Y	Elementary Neutralization System, Flocculation	125,000	
Vitex Extrusions LLC	43 Industrial Park Drive, Franklin, NH 03235	IDP 013		Aluminum Extrusion	40 CFR 467.36	Y	None	2,000	Zero discharger - Recycles Extrusion Die Quench Wastewater
Spinnaker Contract Manufacturing	95 Business Park Drive Tilton,NH 03276	IDP 025		Printed Circuit Board Assembly	40 CFR 469.16	Y	Mesh Screens, Otherwise None.	25,000	Inline PCB Wash System
Total Number of CIU Permits		**10**					**Total CIU Flow**	**296,700**	

Table I-A: Non-Categorical Industrial User Overview

Company Name	Address	Permit #	CY21 Change	Product	Limits (Y/N)		Pretreatment	Permitted Flow (gpd)	Comments
			Add, Delete, Modify		Cat.	Loc.			
Laconia Water Works	117 Stark Street Laconia, NH 03246	IDP 020		Drinking Water	NA	Y	Sedimentation	200,000	
Meredith Water Works	50 Waukewan Street Meredith, NH 03253	IDP 021		Drinking Water	NA	Y	Sedimentation	95,000	
Franklin Water Works	51 Water Street Franklin, NH 03235	IDP 022		Drinking Water	NA	Y	Sedimentation	55,000	
Concord Regional Solid Waste Resource Recovery Co-op	73 Punch Brook Road Franklin, NH 03235	IDP 023		Incinerator Ash Landfill Leachate	NA	Y	Metal Hydroxide Precipitation	35,000	
Watts Regulator Co.	583 South Main Street Franklin NH 03235	IDP 031		Valves, Regulators, Thermostats, & Back-flow Preventer devices	NA	Y	Oil/water separator	11,500	
Kettlehead Brewing Co.	407 West Main Street Tilton, NH 03276	IDP 024		Beer	NA	Y	Pollution prevention practices, pH adjustment & side streaming	100	100 gallons/day no more than 200 gallons/week
Vulgar Brewing Co.	378 Central Street Franklin, NH 03235	IDP 026		Beer	NA	Y	Pollution prevention practices, pH adjustment & side streaming	100	50 gallons/day and 100 gallons/week
Twin Barns Brewing Co.	194 Daniel Webster Highway Meredith, NH 03253	IDP 027		Beer	NA	Y	Pollution prevention practices, pH adjustment & side streaming	100	100 gallons/day no more than 200 gallons/week
Total Number of non-CIU Permits		**8**					**Total Non-CIU Flow**	396,800	
Total Number of SIU Permits		**18**					**Total SIU Flow**	**693,500**	

NA= Not Applicable

Table II: Categorical Industrial User Compliance Status

Company Name	Permit #	BMR received	New CIU Compliance	Monitoring Reports OK (4/year)	Compliance Status				Comments
					Local Limits		Categorical Limits		
Smiths Tubular System Laconia Inc. dba Titeflex Aerospace	IDP 001	NA	NA	Yes	Yes		Yes		
Smiths Tubular System Laconia Inc. dba Titeflex Aerospace	IDP 002	NA	NA	Yes	Yes		Yes		
Cooper Products, Inc.	IDP 005	NA	NA	Yes	Yes		Yes		No process wastewater discharged in 2021
Freudenberg NOK Sealing Technologies	IDP 006	NA	NA	Yes, 1 of 4 Late	Yes		Yes		Report was submitted <15 days after due date
PCC Structurals Inc.	IDP 007	NA	NA	Yes, 1 of 12 Late, Monthly Reports (12/year)	**No**	Oil and grease exceedances in April, July, October, and December	Yes		Report was submitted <15 days after due date. Oil and grease exceedances did not warrant Significant Non-complaince.
New Hampshire Ball Bearings Inc.	IDP 008	NA	NA	Yes, 1 of 4 Late	Yes		Yes		Report was submitted <15 days after due date
Aavid Thermalloy LLC.	IDP 009	NA	NA	Yes	Yes		Yes		CN sample in November 2021 was collected at wrong location
PCC Structurals Inc.	IDP 010	NA	NA	Yes, 2 of 4 Late	Yes		**No**	Oil and Grease violations in Q1, Q2, and Q3, Copper Exceedance in Q4	PCC is in Significant Non-Compliance for oil and grease. Reports were submitted <15 days after due date
Vitex Extrusions LLC	IDP 013	NA	NA	Yes, 3 of 4 Late	Yes		Yes		No Process wastewater discharged in 2021. Reports were submitted <15 days after due date
Spinnaker Contract Manufacturing	IDP 025	NA	NA	Yes, 3 of 4 Late	Yes		Yes		Reports were submitted <15 days after due date
Total Required		0	0	48	10		10		
Total Received		0		48					
Total Non-Compliance		0	0	0	1		1		
Total Compliance		0	0	48	9		9		
Total % Non-compliance		**0%**	**0%**	**0%**	**10%**		**10%**		

NA= Not Applicable
BMR= Baseline Monitoring Report

Table II-A: Non-Categorical Industrial User Compliance Status

Company Name	Permit #	BMR received	New CIU Compliance	Monitoring Reports OK (4/year)	Compliance Status				Comments
					Local Limits		Categorical Limits		
Laconia Water Works	IDP 020	NA	NA	Yes	Yes		NA		
Meredith Water Works	IDP 021	NA	NA	Yes, 1 of 4 Late	Yes		NA		Report was submitted <15 days after due date
Franklin Water Works	IDP 022	NA	NA	Yes	Yes		NA		
Concord Regional Solid Waste Resource Recovery Co-op	IDP 023	NA	NA	Yes, 3 of 4 Late	Yes		NA		Reports were submitted <15 days after due date
Watts Regulator Co.	IDP 031	NA	NA	Yes, 3 of 4 Late	Yes		NA		Reports were submitted <15 days after due date
Kettlehead Brewing Co.	IDP 024	NA	NA	Yes, 1 of 4 Late	Yes		NA		Report was submitted <15 days after due date
Vulgar Brewing Co.	IDP 026	NA	NA	Yes, 1 of 4 Late	Yes		NA		Report was submitted <15 days after due date
Twin Barns Brewing Co.	IDP 027	NA	NA	Yes	Yes		NA		
Total Required		0	0	32	8		NA		
Total Received		0		32					
Total Non-Compliance		0	0	0	0		NA		
Total Compliance		0	0	32	8		NA		
Total % Non-compliance		**0%**	**0%**	**0%**	**0%**		**NA**		
Grand Total Required		**0**	**0**	**80**	**18**		**10**		
Grand Total Received		**0**		**80**					
Grand Total Non-Compliance		**0**	**0**	**0**	**1**		**1**		
Grand Total Compliance		**0**	**0**	**0**	**17**		**9**		
Grand Total % Non-compliance		**0%**	**0%**	**0%**	**5.55%**		**10%**		

NA= Not Applicable
BMR= Baseline Monitroing Report

Table III: Categorical Industrial User Compliance and Enforcement

Company Name	Permit #	WRBP Inspection Dates	Sampling Dates	LOD/NPV/NoF		AFs		SNC Publication		Comments
				Date	Type/Reason	Date	Reason	Date	Reason	
Smiths Tubular System Laconia Inc. dba Titeflex Aerospace	IDP 001	9/20/2021	3/30/21, 6/28/21, 9/20/21, 9/29/21, 12/27/21	NA		NA		NA		
Smiths Tubular System Laconia Inc. dba Titeflex Aerospace	IDP 002	9/21/2021	3/30/21, 6/28/21, 9/21/21, 9/29/21, 12/27/21	NA		NA		NA		
Cooper Products, Inc.	IDP 005	3/29/2021	No Samples Collected	NA		NA		NA		No wastewater discharged in 2021
Freudenberg NOK Sealing Technologies	IDP 006	9/3/2021	3/3/21, 7/9/21, 9/3/21	NA		NA		NA		
PCC Structurals Inc.	IDP 007	9/8/2021	1/7/21, 2/5/21, 3/5/21, 4/9/21, 5/7/21, 6/4/21, 7/14/21, 8/6/21, 9/8/21, 9/9/21, 10/8/21, 11/12/21, 12/10/21	NA		NA		NA		
New Hampshire Ball Bearings Inc.	IDP 008	12/7/2021	1/26/21, 7/23/21, 12/7/21	NA		NA		NA		
Aavid Thermalloy LLC.	IDP 009	11/2/2021	2/16/21, 5/18/21, 8/10/21, 11/2/21, 12/29/21	NA		NA		NA		
PCC Structurals Inc.	IDP 010	9/9/2021	1/6/21, 4/9/21, 8/4/21, 9/9/21, 10/7/21, 11/12/21	4/6/2022	NPV for oil and grease violations	NA		**4/13/2022**	**Oil and Grease violations in Q1, Q2, and Q3**	Notice of Past Violation (NPV) sent on April 6th, 2022. PCC is in SNC for Periods 1 and 2 under the TRC and Periods 2 and 3 under the CRC.
Vitex Extrusions LLC	IDP 013	12/29/2021	No Samples Collected	NA		NA		NA		No wastewater discharged in 2021
Spinnaker Contract Manufacturing	IDP 025	11/8/2021	5/10/21, 10/20/21, 11/8/21	NA		NA		NA		
Total CIU		10						1		

LOD= Letter of Defficiency
NPV= Notice of Past Violation
NoF= Notice of Findings
AF= Administrative Fine
NA= Not applicable

SNC= Significant Non-Compliance
TRC= Technical Review Criteria
CRC= Chronic Review Criteria

Table III-A: Non-Categorical Industrial User Compliance and Enforcement

Company Name	Permit #	WRBP Inspection Dates	Sampling Dates	LOD/NPV/NoF		AFs		SNC Publication		Comments
				Date	Reason	Date	Reason	Date	Reason	
Laconia Water Works	IDP 020	8/10/2021	2/7/21, 5/5/21, 8/10/21, 11/2/21	NA		NA		NA		
Meredith Water Works	IDP 021	6/16/2021	1/5/2021, 4/6/21, 6/16/21, 7/6/21, 10/5/21	NA		NA		NA		
Franklin Water Works	IDP 022	7/29/2021	3/10/21, 5/18/21, 7/29/21 8/4/21, 12/2/21	NA		NA		NA		
Concord Regional Solid Waste Resource Recovery Co-op	IDP 023	6/21/2021	3/31/21, 6/9/21, 6/21/21 9/30/21, 12/21/21	NA		NA		NA		
Watts Regulator Co.	IDP 031	11/29/2021	6/4/21, 10/8/21, 11/29/21	NA		NA		NA		
Kettlehead Brewing Co.	IDP 024	12/15/2021	3/23/21, 9/28/21, 12/15/21	NA		NA		NA		
Vulgar Brewing Co.	IDP 026	12/28/2021	3/24/21, 12/28/21	NA		NA		NA		
Twin Barns Brewing Co.	IDP 027	12/17/2021	4/27/21, 9/30/21, 12/17/21	NA		NA		NA		
Total Non-CIU		8						0		
Total SIU		18						1		

LOD= Letter of Defficiency
NPV= Notice of Past Violation
NoF= Notice of Findings
AF= Administrative Fine
NA= Not applicable

SNC= Significant Non-Compliance

TABLE IV-A : CY 2021 Quarterly Headworks Monitoring Results

Sample Date	Flow (MGD)	Loading	As	Cd	Cr	Cu	CN	Pb	Hg	Mo	Ni	Se	Ag	Zn
2/1/2021	3.712	mg/L	< 0.1	< 0.01	< 0.01	0.038	< 0.02	< 0.01	< 0.0001	< 0.01	< 0.01	< 0.1	< 0.01	0.16
		lbs/day	< 3.095808	< 0.309581	< 0.309581	1.176407	< 0.619162	< 0.309581	< 0.003096	< 0.309581	< 0.309581	< 3.095808	< 0.309581	4.953293
4/19/2021	5.29	mg/L	< 0.1	< 0.01	< 0.01	0.029	NT	< 0.1	< 0.0001	< 0.01	< 0.01	< 0.1	< 0.01	0.13
		lbs/day	< 4.41186	< 0.441186	< 0.441186	1.279439	NT	< 4.41186	< 0.004412	< 0.441186	< 0.441186	< 4.41186	< 0.441186	5.735418
8/23/2021	5.602	mg/L	0.0011	< 0.001	< 0.005	< 0.05	NT	< 0.0032	< 0.0005	< 0.005	< 0.005	< 0.005	< 0.005	0.155
		lbs/day	0.051393	< 0.046721	< 0.233603	< 2.336034	NT	< 0.149506	< 0.02336	< 0.233603	< 0.233603	< 0.233603	< 0.233603	7.241705
10/25/2021	3.74	mg/L	0.0017	< 0.001	< 0.005	0.073	NT	0.0104	< 0.0005	< 0.005	0.0067	< 0.005	< 0.005	0.425
		lbs/day	0.053026	< 0.031192	< 0.155958	2.276987	NT	0.324393	< 0.015596	< 0.155958	0.208984	< 0.155958	< 0.155958	13.25643
MAHWL [1] in mg/L		Limit	0.100	1.000	1.000	1.000	NA	1.000	0.100	NA	1.000	NA	0.250	5.000
		Max.	< 0.1	< 0.01	< 0.01	0.073	< 0.02	< 0.1	< 0.0005	< 0.01	< 0.01	< 0.1	< 0.01	0.425
		Min.	0.0011	< 0.001	< 0.005	0.029	< 0.02	< 0.0032	< 0.0001	< 0.005	< 0.005	< 0.005	< 0.005	0.13
		Avg.	< 0.1	< 0.01	< 0.01	< 0.05	< 0.02	< 0.1	< 0.0005	< 0.01	< 0.01	< 0.1	< 0.01	0.2175
MAHWL [2] in lbs./day		A.S.	4.97	75.18	59.39	141.71	6.28	10.67	5.1	NA	56.36	NA	13.1	116.51
		W.Q.	**0.62**	1.92	431.47	74.77	25.41	4.94	0.15	NA	220.41	27.09	**0.81**	428.22
		L.A	0.67	**0.53**	**12.91**	**10.79**	NA	**2.69**	**0.14**	**0.94**	**6.43**	**0.45**	NA	**22.09**
		D.I.	1.74	18.02	78.87	19.19	**3.75**	203.24	NA	NA	10.2	NA	9.06	210.42
		Max.	< 4.41186	< 0.441186	< 0.441186	< 2.336034	< 0.619162	< 4.41186	< 0.02336	< 0.441186	< 0.441186	< 4.41186	< 0.441186	13.25643
		Min.	0.051393	0.031192	0.155958	1.176407	0.619162	0.149506	0.003096	0.155958	0.208984	0.155958	0.155958	4.953293
		Ave.	< 4.41186	< 0.441186	< 0.441186	< 2.336034	< 0.619162	< 4.41186	< 0.02336	< 0.441186	< 0.441186	< 4.41186	< 0.441186	7.796712

MAHWL= Maximum Allowable Headworks Loadings

1. MAHWL values shown in mg/l are the minimum inhibition threshold levels for the activated sludge process.

2. The MAHWL values in lbs/day are the calculated local limit levels based on each of the following criteria: A.S. Threshold Inhibition Levels, Digester Threshold Inhibition Levels, Water Quality Standards, and Sludge Quality Standards. The MAHWL values are shown for each criteria and the most restrictive loadings **(Bolded)** are the compared to the sampling results for compliance with the criteria

A.S. - Activated Sludge Process Threshold Inhibition
W.Q. - Water Quality, Chronic Criteria
L.A. - Land Application Criteria
D.I. - Digester Threshold Inhibition

NT = Not Tested
NA = Not Applicable

TABLE IV - B : CY 2021 Quarterly Influent Monitoring Results

Sample Date	As	Cd	Cr	Cu	Pb	Hg	Ni	Ag	Zn
2/1/2021	< 0.1	< 0.01	0.015	0.077	< 0.01	< 0.0001	< 0.01	< 0.01	0.224
4/19/2021	< 0.1	< 0.01	< 0.01	0.035	< 0.01	< 0.0001	< 0.01	< 0.01	0.152
8/23/2021	0.0012	< 0.001	< 0.005	< 0.05	0.0039	< 0.0005	< 0.005	< 0.005	0.178
10/25/2021	0.0016	< 0.001	< 0.005	0.073	0.0046	< 0.0005	< 0.005	< 0.005	0.241
A.S. Limit	0.100	1.000	1.000	1.000	1.000	0.100	1.000	0.250	5.000
Max.	< 0.1	< 0.01	0.015	0.077	< 0.01	< 0.0005	< 0.01	< 0.01	0.241
Min.	0.0012	< 0.001	< 0.005	< 0.05	0.0039	< 0.0001	< 0.005	< 0.005	0.152
Avg.	< 0.1	< 0.01	< 0.015	< 0.05875	< 0.01	< 0.0005	< 0.01	< 0.01	0.19875

All results in mg/L unless otherwise noted

A.S.= Inhibition Values for Activated Sludge

Recirculation flows from Operations Building drain pumps which includes in-house domestic and centrate from centrifuge

TABLE IV - C : CY 2021 Quarterly Primary Influent Monitoring Results

Sample Date	As	Cd	Cr	Cu	Pb	Hg	Ni	Ag	Zn
2/1/2021	< 0.1	< 0.01	< 0.01	0.043	< 0.01	< 0.0001	< 0.01	< 0.01	0.156
4/19/2021	< 0.1	< 0.01	< 0.01	0.037	< 0.01	< 0.0001	< 0.01	< 0.01	0.136
8/23/2021	0.0012	< 0.001	< 0.005	< 0.05	0.0027	< 0.0005	< 0.005	< 0.005	0.179
10/25/2021	0.002	< 0.001	0.0069	0.121	0.0103	< 0.0005	0.0076	< 0.005	0.521
A.S. Limit	0.100	1.000	1.000	1.000	1.000	0.100	1.000	0.250	5.000
Max.	< 0.1	< 0.01	< 0.01	0.121	0.0103	< 0.0005	< 0.01	< 0.01	0.521
Min.	0.0012	< 0.001	< 0.005	0.037	0.0027	< 0.0001	< 0.005	< 0.005	0.136
Avg.	< 0.1	< 0.01	< 0.01	< 0.06275	< 0.01	< 0.0005	< 0.01	< 0.01	0.248

All results in mg/L unless otherwise noted

A.S.= Inhibition Values for Activated Sludge

Recirculation flows from Operations Building drain pumps (which includes in-house domestic and centrate from centrifuge), supernatant and tunnel 4 drain pit, in addition to Leachate.

TABLE IV - D : CY 2021 Quarterly Primary Effluent Monitoring Results

Sample Date	As	Cd	Cr	Cu	Pb	Hg	Ni	Ag	Zn
2/1/2021	< 0.1	< 0.01	< 0.01	0.025	< 0.01	< 0.0001	< 0.01	< 0.01	0.088
4/19/2021	< 0.1	< 0.01	< 0.01	0.025	< 0.01	< 0.0001	< 0.01	< 0.01	0.106
8/23/2021	0.0010	< 0.001	< 0.005	< 0.05	0.0010	< 0.0005	< 0.005	< 0.005	0.077
10/25/2021	0.0015	< 0.001	< 0.005	< 0.05	0.0015	< 0.0005	< 0.005	< 0.005	0.115
A.S. Limit	0.100	1.000	1.000	1.000	1.000	0.100	1.000	0.250	5.000
Max.	< 0.1	< 0.01	< 0.01	< 0.05	< 0.01	< 0.0005	< 0.01	< 0.01	0.115
Min.	0.0012	< 0.001	< 0.005	0.025	< 0.01	< 0.0001	< 0.005	< 0.005	0.077
Avg.	< 0.1	< 0.01	< 0.01	< 0.05	< 0.01	< 0.0005	< 0.01	< 0.01	0.0965

All results in mg/L unless otherwise noted

A.S.= Inhibition Values for Activated Sludge

TABLE IV - E : CY 2021 Quarterly Effluent Monitoring Results

Sample Date	As	Cd	Cr	Cu	CN	Pb	Hg	Mo	Ni	Se	Ag	Zn
1/11/2021*	NT	< 0.0003	< 0.001	0.012	NT	< 0.0003	NT	NT	0.0019	NT	NT	0.048
2/1/2021	< 0.1	< 0.01	< 0.01	0.01	< 0.02	< 0.01	< 0.0001	< 0.01	< 0.01	< 0.01	< 0.01	0.055
4/12/2021*	NT	< 0.001	0.00048	0.0107	NT	0.000236	NT	NT	0.00169	NT	NT	< 0.0125
4/19/2021	< 0.1	< 0.01	< 0.01	0.011	NT	< 0.01	< 0.0001	< 0.01	< 0.01	< 0.1	< 0.01	0.034
7/12/2021*	NT	< 0.0001	< 0.0004	0.00625	NT	0.000309	NT	NT	0.00196	NT	NT	0.0293
8/24/2021	< 0.001	< 0.001	< 0.005	< 0.05	NT	< 0.001	< 0.0005	< 0.005	< 0.005	< 0.005	< 0.005	0.033
10/18/2021*	NT	< 0.0001	0.00051	0.00708	NT	0.000306	NT	NT	0.00182	NT	NT	0.0201
10/25/2021	< 0.001	< 0.001	< 0.005	< 0.05	NT	< 0.001	< 0.0005	< 0.005	< 0.005	< 0.005	< 0.005	0.086
WQC1 Max.	0.002603	0.03811	1.05605	0.11020	0.23876	0.02479	0.04178	NA	0.61251	0.22958	15.18492	1.39720
WQC2 Max.	0.0015	0.0215	0.5958	0.0622	0.1347	0.0140	0.0236	NA	0.3455	0.1295	8.4658	0.7882
Max.	< 0.1	< 0.01	< 0.01	0.012	< 0.02	< 0.01	< 0.0005	< 0.01	< 0.01	< 0.1	< 0.01	0.086
Min.	< 0.001	< 0.0001	< 0.0004	0.00625	< 0.02	0.000236	< 0.0001	< 0.005	0.00169	< 0.005	< 0.005	< 0.0125
Avg.	< 0.1	< 0.01	< 0.01	< 0.012	< 0.02	< 0.01	< 0.0005	< 0.01	< 0.01	< 0.1	< 0.01	< 0.039738

All results in mg/L unless otherwise noted

WQC1 Max. = maximum allowable concentration in effluent at current average flow of 6.376 MGD in 2021

WQC2 Max. = maximum allowable concentration in effluent at design flow of 11.5 MGD.

NT = Not Tested

(*) = Results from WET Testing

Table IV-F: CY 2021 Summary of WRBP Effluent Toxicity Monitoring

Acute Testing LC 50 [1]	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Limits
Ceriodaphnia dubia	>100%	>100%	>100%	>100%	**≥ 100%**
Pimephales promelas	>100%	>100%	>100%	>100%	**≥ 100%**
Ammonia-N (mg/L)	19.5	17.8	18.2	19.3	**NA**

Acute Testing A-NOEC [2]	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Limits
Ceriodaphnia dubia	NC	NC	NC	NC	**REPORT**
Pimephales promelas	NC	NC	NC	NC	**REPORT**

[1]Median lethal concentration, or LC-50, defined as the effluent concentration that kills half of the test animals.

[2]As needed, the A-NOEC (no observed effect concentration) was determined as the highest test concentration that caused no significant mortality.

NA = Not Applicable
NC = Not Calculated

Table IV - G : CY 2021 Effluent Concentration Limit Calculations

	Pollutant	Q_{strc}*0.9	Q_p	C_c	$[((Q_{strc}*0.9)+(Q_p))/(Q_p)]*C_c=L_c$	L_c
WQC1	ARSENIC[1]	915.71	6.376	0.000018	((915.71 + 6.084)/6.084)*0.000018	0.002603
	SILVER[1]			0.105	((915.71 + 6.084)/6.084)*0.105	15.18492
	CHROMIUM[3]	286.38		0.023	((286.38 + 6.084)/6.084)*0.023	1.056052
	CYANIDE			0.0052	((286.38 + 6.084)/6.084)*0.0052	0.23876
	MERCURY[3]			0.00091	((286.38 + 6.084)/6.084)*0.00091	0.041783
	NICKLE[3]			0.01334	((286.38 + 6.084)/6.084)*0.01334	0.61251
	CADMIUM[2]			0.00083	((286.38 + 6.084)/6.084)*0.00083	0.03811
	COPPER[3]			0.0024	((286.38 + 6.084)/6.084)*0.0024	0.110197
	LEAD[2]			0.00054	((286.38 + 6.084)/6.084)*0.00054	0.024794
	MOLYBDENUM			NA	NA	NA
	SELENIUM			0.005	((286.38 + 6.084)/6.084)*0.005	0.229577
	ZINC[3]			0.03043	((286.38 + 6.084)/6.084)*0.03043	1.397203

	Pollutant	Q_{strc}*0.9	Q_d	C_c	$[((Q_{strc}*0.9)+(Q_d))/(Q_d)]*C_c=L_c$	L_c
WQC2	ARSENIC[1]	915.71	11.5	0.000018	((915.71 + 11.5)/11.5)*0.000018	0.001451
	SILVER[1]			0.105	((915.71 + 11.5)/11.5)*0.105	8.46583
	CHROMIUM[3]	286.38		0.023	((286.38 + 11.5)/11.5)*0.023	0.59576
	CYANIDE			0.0052	((286.38 + 11.5)/11.5)*0.0052	0.134694
	MERCURY[3]			0.00091	((286.38 + 11.5)/11.5)*.00091	0.023571
	NICKLE[3]			0.01334	((286.38 + 11.5)/11.5)*0.01334	0.345541
	CADMIUM[2]			0.00083	((286.38 + 11.5)/11.5)*0.00083	0.021499
	COPPER[3]			0.0024	((286.38 + 11.5)/11.5)*0.0024	0.062166
	LEAD[2]			0.00054	((286.38 + 11.5)/11.5)*0.00054	0.013987
	MOLYBDENUM			NA	NA	NA
	SELENIUM			0.005	((286.38 + 11.5)/11.5)*0005	0.129513
	ZINC[3]			0.03043	((286.38 + 11.5)/11.5)*0.03043	0.788216

L_c = POTW effluent concentration limit based on Surface Water Quality, chronic criteria in mg/L

Q_{strc} = 90% of 7Q10 of receiving stream flow (318.2 MGD)

C_c = Surface Water Quality standard - chronic concentration, mg/L

Q_d = POTW design flow (11.5 MGD)

Q_p = POTW avg. flow (6.376 MGD in 2021)

[1] Surface Water Quality Standards were obtained from the NH DES Surface Water 1700 Rules, effective 12/1/2016. The 2017 NPDES permit used the human health criteria for Inorganic Arsenic using harmonic mean flow. The Water Quality Standard health concentration was used to calculate the Silver effluent concentration limit so harmonic mean flow was also used in this calculation. There is no designated chronic criteria for Silver.

2. The Water Quality Standard - chronic concentration was obtained from the WRBP NPDES Permit # NH010096, effective January 1, 2017. The chronic concentration criteria includes an adjustment for hardness and value used is that in the 2017 WRBP NPDES permit.

3. The Water Quality Standard - chronic concentration was obtained from the NH DES Surface Water 1700 Rules, effective 12/1/2016. The Water Quality Standard - chronic concentration was calculated as total recoverable metals.

TABLE IV - H: CY 2021 Biosolids Metals Monitoring Results

Sample Date	% Solids	As	Cd	Cr	Cu	Pb	Hg	Mo	Ni	Se	Ag	Zn
1/13/2021	22	4.24	2.84	20.2	526	24.2	0.249	9.21	16.5	< 2.50	NT	1420
3/22/2021*	26	10.50	2.87	43.7	585	47.3	0.846	9.35	24.2	8.29	5.61	1800
5/18/2021	25	8.72	4.27	29.9	578	39.0	0.341	11.3	18.4	3.18	NT	1970
8/17/2021	25	7.10	2.80	19.4	507	36.7	0.386	8.38	14.5	8.94	1.79	1950
10/21/2021	24	8.08	2.28	19.3	565	29.4	< 0.02	10.8	15.8	6.98	NT	1660
11/22/2021	28	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	1615
503.13 Land Application		41	39	NS	1500	300	17	NS	420	100	NS	2800
503.13 Land Application		75	85	NS	4300	840	57	75	420	100	NS	7500
Env-Ws 800 SQC		32	14	1000	1500	300	10	35	200	28	NS	2500
ENV-Ws 800 LMS		**10**	**10**	**160**	**1000**	**270**	**7**	**18**	**98**	**18**	NS	**1780**
Max.	28	10.50	4.27	43.70	585	47.30	0.85	11.30	24.20	8.94	5.61	1970
Min.	22	4.24	2.28	19.30	507	24.20	< 0.02	8.38	14.50	< 2.50	1.79	1420
Avg.	25	7.73	3.01	26.50	552	35.32	0.37	9.81	17.88	5.98	3.70	1736

All results in mg/kg unless otherwise noted

A.S.= Inhibition Values for Activated Sludge

* Samples Collected by NHDES Residuals Management Section

TABLE IV - I: CY 2021 Biosolids Non-Metals Monitoring Results

Sample Date	pH (*s.u.*)	% Solids	Total Kjeldahl Nitrogen	Ammonia	Total Organic Nitrogen	Nitrate-Nitrite	Phosphorus	Potassium
1/13/2021	**7.82**	**22**	**49200**	**9770**	**39500**	< 22.5	**23600**	**1170**
5/18/2021	**7.79**	**25**	**46200**	**8470**	**37700**	< 5	**26000**	**1050**
8/17/2021	**7.79**	**25**	**51200**	**5830**	**45400**	< 19.9	**7110**	**1010**
10/21/2021	**8.26**	24	**42100**	**7680**	**34400**	< 20.8	**12300**	**1110**
Max.	8.26	25	51200	9770	45400	< 22.5	26000	1170
Min.	7.79	22	42100	5830	34400	< 5	7110	1010
Avg.	7.92	24	47175	7937.5	39250	< 22.5	17252.5	1085

All results in mg/L unless otherwise noted

A.S.= Inhibition Values for Activated Sludge

Table IV-J: CY 2021 Biosolid Production Yield

Month	% Cake (Mo. Average)	Bulk Density (lbs/yd^3)	Land Application[1] Wet Cubic Yards	Stock Piled Wet Cubic Yards	Dry Metric Tons Monthly Total
January	23.62	1238.39	158	0	20.95
February	22.86	1238.39	158	0	20.29
March	23.16	1238.39	256	0	33.2
April	24.24	1165.30	241	0	32.82
May	23.97	1165.30	192	0	25.85
June	24.72	1165.30	268	0	37.18
July	24.81	1277.90	312	0	43.53
August	25.62	1277.90	315	0	46.76
September	24.58	1277.90	250	0	35.64
October	25.50	1145.20	295	0	39.07
November	27.70	1145.20	252	0	35.99
December	28.29	1145.20	261	0	38.34
Average	24.92	1206.70			34.135
Subtotal for year			2958	0	
Total for Year			2958		409.62

[1]All Biosolids Transported to Merrimack WWTF

Table V-A: PFAS Monitoring- WWTF Wastewater

Compounds (ng/L)		1/13/2021		2/24/2021		3/26/2021		4/27/2021		5/13/2021		6/22/2021		7/29/2021		8/19/2021		9/28/2021		10/29/2021		11/16/2021		12/13/2021	
		Influent	Effluent	Influent	Effluent	Influent	Effluent	Influent	Effluent	Influent	Effluent	Influent	Effluent	Influent	Effluent	Influent	Effluent	Influent	Effluent	Influent	Effluent	Influent	Effluent	Influent	Effluent
Perfluorobutanesulfonic acid	PFBS	3.9 I	7.6	2.5	12	4.1	5.2	3.9	7.8	31	12	3.2	4.1 I	12 J	7.7 J	3.6	3.2	5.0	4.8	4.3 HI	3.2	3.8	5.3	4.2 I	3.3
Perfluorobutanoic acid	PFBA	3.2 J	5.0	4.5	13.0	5.0	4.7	2.9 J	5.0	28	11.0	3.6 J	3.3 J	<19	<20	5.0	5.6	5.3	4.5	8.0 H	5.2	3.6 J	4.0 J	2.4 J	3.5 J
Perfluorodecanesulfonic acid	PFDS	<0.43	<0.45	<0.45	<0.46	<0.47	<0.45	<0.45	<0.46	<0.42	<0.47	<0.44	<0.44	<4.8	<5.0	0.74 JI	<0.46	<0.43	<0.44	<0.44	<0.46	<0.44	<0.46	<0.42	<0.45
Perfluorodecanoic acid	PFDA	<0.43	0.49 J	<0.45	<0.46	<0.47	0.65 J	<0.45	0.81 JI	0.99 J	0.60 J	0.69 J	<0.44	<4.8	<5.0	<0.43	0.72 J	<0.43	0.56 J	<0.44	<0.46	<0.44	0.59 J	<0.42	0.57 J
Perfluorododecanoic acid	PFDoA	<0.43	<0.45	<0.45	<0.46	<0.47	<0.45	<0.45	<0.46	<0.42	<0.47	<0.44	<0.44	<4.8	<5.0	<0.43	<0.46	<0.43	<0.44	<0.44	<0.46	<0.44	<0.46	<0.42	<0.45
Perfluoroheptanesulfonic acid	PFHpS	<0.43	<0.45	<0.45	<0.46	<0.47	<0.45	<0.45	<0.46	<0.42	<0.47	<0.44	<0.44	<4.8	<5.0	<0.43	<0.46	<0.43	<0.44	<0.44	<0.46	<0.44	<0.46	<0.42	<0.45
Perfluoroheptanoic acid	PFHpA	0.78 J	2.7	0.49 JI	4.3	1.2 J	1.8	1.7 J	3	7.5	3.9	1.0 J	3.0 I	<4.8	<5.0	2.2	2	1.6 J	3.6 I	1.4 JH	2	1.3 J	1.8	1.1 J	1.4 J
Perfluorohexanesulfonic acid	PFHxS	1.1 JI	2.4	<0.45	3.3	1.7 J	2.0	1.6 JI	2.3	8.7	3.2	<0.44	<0.44	<4.8	<5.0	1.7	1.3 J	3.0 I	1.9	2.0 HI	1.2 J	1.5 JI	2.1	1.4 JI	1.2 J
Perfluorohexanoic acid	PFHxA	4.7	14	4.4	22	3.9	10	6.3	14	52	40	4.1	8.7	9.5 J	12 J	7.3	19	5.4	11	4.6 H	12	5.3	8.7	4.5	7.2
Perfluorononanoic acid	PFNA	0.57 J	1.0 J	<0.45	1.2 J	0.94 J	1.2 J	0.87 J	1.3 J	2.8	1.3 JI	1.0 J	1.1 J	<4.8	<5.0	1.2 J	1.7 J	1.2 J	1.4 J	0.98 JH	1.4 J	1.0 J	1.1 J	0.53 J	0.74
Perfluorooctanesulfonamide	PFOSA	<0.43	0.63 J	<0.45	<0.46	<0.47	<0.45	<0.45	<0.46	<0.42	<0.47	<0.44	<0.44	<4.8	<5.0	<0.43	0.50 J	<0.43	<0.44	<0.44	<0.46	<0.44	<0.46	<0.42	<0.45
Perfluorooctanesulfonic acid	PFOS	3.0	2.9	4.6 IB	3.4 B	2.9	2.8	4.0 I	3.9	6.3	3.9	6.9 I	2.7	7.7 J	8.1 J	4.1	3.4	4.4 B	3.2	4.5 H	3.4 I	3.6	3.8	3.3	2.4
Perfluorooctanoic acid	PFOA	3.7	6.5	3.4	10	3.7	6.1	4.5	7.6	37	11	3.2	4.0	10 J	8.5 J	4.7	4.7	4.0	5.0	3.3 H	4.9	3.5	4.7	2.9	3.4
Perfluoropentanoic acid	PFPeA	2.1	4.4	2.2	6.3	3.1	4.1	4	4.7	15	6.1	2.9	2.7	6.2 J	<5.0	5.5	4.3	4.2	4.2	4.0 H	5.1	4.8	3.7	1.4 J	3.1
Perfluorotetradecanoic acid	PFTeDA	<0.43	<0.45	<0.45	<0.46	<0.47	<0.45	<0.45	<0.46	<0.42	<0.47	<0.44	<0.44	<4.8	<5.0	<0.43	<0.46	<0.43	<0.44	<0.44	<0.46	<0.44	<0.46	<0.42	<0.45
Perfluorotridecanoic acid	PFTrDA	<0.43	<0.45	<0.45	<0.46	<0.47	<0.45	<0.45	<0.46	<0.42	<0.47	<0.44	<0.44	<4.8	<5.0	<0.43	<0.46	<0.43	<0.44	<0.44	<0.46	<0.44	<0.46	<0.42	<0.45
Perfluoroundecanoic acid	PFUnA	<0.43	<0.45	<0.45	<0.46	<0.47	<0.45	<0.45	<0.46	<0.42	<0.47	<0.44	<0.44	<4.8	<5.0	<0.43	<0.46	<0.43	<0.44	<0.44	<0.46	<0.44	<0.46	<0.42	<0.45
	Flow (MGD)	4.414	5.859	3.582	5.271	9.091	6.639	5.439	6.976	5.771	7.537	3.591	4.815	6.499	7.128	5.558	6.615	3.969	5.71	3.765	5.2	5.21	5.375	5.338	6.35

NT= Not Tested

J (or G, X, or I) Estimated value > the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
(H) Outside of Holding Time

Table V-B: PFAS Monitoring- WWTF Biosolids

Compounds (ng/g)		Biosolids											Digester Sludge (Feed Sludge)			Centrate			
		4/26/2017 [1]	12/27/2018 [2]	2/5/2019 [3]	8/16/2019 [4]	1/23/2020 [6]	3/9/2020 [4]	3/12/2020 [7]	1/13/2021 [8]	3/22/21 [4]	5/10/21 [9]	5/10/2021 [10]	1/27/2022	3/8/2019 [5]	12/26/2019 [6]	1/27/2022	1/23/2020 [6]	6/18/2020	1/13/2021 [8]	1/27/2022
Perfluorobutanesulfonic acid	PFBS	<4.5	**7.5 J**	<0.76	<2.27	<0.79	<39.4	<4.8	<8.6	<9.63	<0.43	<1.78	<0.79	<24	<6.1	<200	**14 J**	**12 J**	**8.8 J**	**9.3 J**
Perfluorobutanoic acid	PFBA	<2.9	**20 J**	<2.3	<2.27	<1.6	<39.5	**31 J**	<17	<19.3	<0.43	<3.55	<1.6	<16	<12	<50	<20	**20 J**	<20	<20
Perfluorodecanesulfonic acid	PFDS	**6.7 J**	<5.9	**2.5 J**	<2.27	**2.2**	<39.6	<4.8	<4.3	<19.3	**2.3**	<3.55	**1.2**	<48	<3.1	<50	<4.9	<4.8	<4.9	<5
Perfluorodecanoic acid	PFDA	**2.6 J**	10 J	**2.2 J**	<2.27	**3.5**	<39.7	<4.8	<4.3	<9.63	**1.9**	<1.78	**1.8**	<24	<3.1	<50	<4.9	<4.8	<4.9	<5
Perfluorododecanoic acid	PFDoA	**5.6 J**	<4.9	**2.0 J**	<2.27	**2.6**	<39.8	<4.8	<4.3	<19.3	**1.4**	<3.55	**1.4**	<16	<3.1	<50	<4.9	<4.8	<4.9	<5
Perfluoroheptanesulfonic acid	PFHpS	<5.2	NT	<0.76	<2.27	<0.39	<39.9	<4.8	<4.3	<19.3	<0.43	<3.55	<0.40	<16	<3.1	<50	<4.9	<4.8	<4.9	<5
Perfluoroheptanoic acid	PFHpA	<3.9	**5.2 J**	<0.76	<2.27	<0.39	<39.10	<4.8	<4.3	<9.63	<0.43	<1.78	<0.40	<16	<3.1	<50	**6.6 J**	**8.9 J**	**6.4 JI**	<5
Perfluorohexanesulfonic acid	PFHxS	<5.2	**9.7 J**	**1.2 J**	<2.27	<0.39	<39.11	**6.9 J**	<4.3	<9.63	**0.81 JI**	<1.78	**1.1 JI**	<16	<3.1	<50	**10 J**	**27**	**11 JI**	**12 J**
Perfluorohexanoic acid	PFHxA	**4.9 J**	**52**	**1.1 J**	<2.27	**2.1**	<39.12	**12 J**	<4.3	<19.3	**1.5**	<3.55	**1.7**	<16	**5.8 J**	**88 J**	**74**	**110**	**63 I**	**70**
Perfluorononanoic acid	PFNA	<3.7	**5.6 J**	**1.4 J**	<2.27	**1.2 J**	<39.13	**6.2 J**	<4.3	<9.63	**1.6**	<1.78	**1.8**	<16	<3.1	<50	<4.9	**5.1 J**	<4.9	**5.4 J**
Perfluorooctanesulfonamide	PFOSA	<3.5	<4.9	**0.83 J**	<2.27	**1.1 J**	<39.14	<4.8	<4.3	<19.3	**0.79 J**	<3.55	**1.1 JI**	<16	<3.1	<50	<4.9	<4.8	<4.9	<5
Perfluorooctanesulfonic acid	PFOS	**17**	**71**	**11**	**9.78**	**12**	<39.15	**9.5 J**	**12 J**	<9.63	**7.7**	**8.29**	**8.2**	<16	**4.7 J**	<50	<4.9	**6.6 J**	**10 J**	<5
Perfluorooctanoic acid	PFOA	<4.5	**31**	**1.3 J**	<2.27	**1.6**	<39.16	**17 J**	<4.3	<9.63	**0.89 J**	<1.78	**0.98 J**	<16	<3.1	<50	**15 J**	**16 J**	**12 J**	**13 J**
Perfluoropentanoic acid	PFPeA	<5.8	<20	<0.76	<2.27	<0.39	<39.17	<4.8	<4.3	<19.3	<0.43	<3.55	<0.40	<16	<3.1	<50	**14 J**	**5.2**	**11 JI**	**5.3 J**
Perfluorotetradecanoic acid	PFTeDA	<2.6	<3.0	<0.76	<2.27	**0.83 J**	<39.18	<4.8	<4.3	<19.3	<0.43	<3.55	**0.87 J**	<16	<3.1	<50	<4.9	<4.8	<4.9	<5
Perfluorotridecanoic acid	PFTrDA	<4.0	<3.9	<0.76	<2.27	**0.59 J**	<39.19	<4.8	<4.3	<19.3	<0.43	<3.55	<0.40	<16	<3.1	<50	<4.9	<4.8	<4.9	<5
Perfluoroundecanoic acid	PFUnA	<5.3	**14 J**	**2.9**	<2.27	**3.6**	<39.20	<4.8	<4.3	<19.3	**2.4**	<3.55	**2.4**	<16	**3.2 J**	<50	<4.9	<4.8	<4.9	<5

[1] Biosolids sample analyzed by Absolute Resource Associates; prior to receiving NCES leachate

[2] Digester # 2 secondary sludge sample (NCES Leachate Trial)

[3] Biosolids sample collected from centrifuge #1 as it fell into the roll-off container (NCES Leachate Trial)

[4] Biosolids sample analyzed by Alpha Analytical for a total of 24 compounds

[5] Woodstock wastewater treatment plant sludge

[6] WRBP NEWSVT Trial

[7] Biosolids via SPLP preparation

[8] Biosolids/ centrate sample collected from centrifuge #2 (NCES temporary increase in discharge during month of December 2020)

[9] Biosolids Split with NHDES Residuals Management Section-Eurofins

[10] Biosolids Split with NHDES Residuals Management Section-Alpha

J (or G+BB4:BX35, X, or I) Estimated value > the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)

Table V-C: PFAS Monitoring- Industrial Discharge Permit Locations 2021

Industry Name / Product		Smiths (IDP001) Stainless steel tubing fabrication	Smiths (IDP002) Stainless steel tubing fabrication	PCC (IDP007) T-28 Aluminum casting	PCC (IDP007) T-95 Aluminum casting	Franklin Ashfill (IDP023) Ash Landfill	Spinnaker (IDP025) Printed circuit board assembly	Aavid (IDP009) Anodized aluminum	Watts (IDP031) Valves & regulators	NHBB (IDP008) Spherical rods and bearings	PCC (IDP010) Investment casting	Freudenberg (IDP006) Molded rubber parts
Compounds (ng/L)		9/21/2021	9/21/2021	9/8/2021	9/9/2021	6/21/2021	11/8/2021	11/2/2021	11/16/2021	12/7/2021	9/9/2021	9/3/2021
Perfluorobutanesulfonic acid	PFBS	**0.91 J**	**2.4**	<5.0	**1.2 J**	**220**	<5	**5**	<0.41	**0.51 J**	**0.77 J**	**0.91 J**
Perfluorobutanoic acid	PFBA	**29**	**4.5 J**	**47 J**	**38**	**230**	<5	**2.7 J**	<1.7	<1.7	<1.7	<1.8
Perfluorodecanesulfonic acid	PFDS	<0.47	**0.59 J**	<5	<0.43	<0.43	<5	<0.44	<0.41	<0.42	<0.43	<0.44
Perfluorodecanoic acid	PFDA	<0.47	**1.9 JI**	<5	**0.48 J**	**2.3**	<5	<0.44	<0.41	<0.42	<0.43	<0.44
Perfluorododecanoic acid	PFDoA	<0.47	**0.55 J**	<5	<0.43	<0.43	<5	<0.44	<0.41	<0.42	<0.43	<0.44
Perfluoroheptanesulfonic acid	PFHpS	<0.47	<0.52	<5	<0.43	**2.7**	<5	**3.2**	<0.41	<0.42	<0.43	<0.44
Perfluoroheptanoic acid	PFHpA	**0.95 J**	**1.6 J**	<5	**96**	**190**	<5	**1.0 J**	<0.41	**0.76 J**	<0.43	<0.44
Perfluorohexanesulfonic acid	**PFHxS**	**30 I**	**3.5 I**	<5	**0.47 J**	**70**	<5	**17**	<0.41	<0.42	<0.43	<0.44
Perfluorohexanoic acid	PFHxA	**1.9**	**2.7**	**33**	<0.43	**310**	<5	<0.44	**0.44 J**	**0.80 J**	**0.47 J**	<0.44
Perfluorononanoic acid	**PFNA**	**0.65 J**	**1.2 JI**	<5	<0.43	**7.8**	<5	**0.51 J**	<0.41	**0.47 J**	<0.43	<0.44
Perfluorooctanesulfonamide	PFOSA	<0.47	<0.52	<5	<0.43	**1.8**	<5	**4.1**	**0.93 J**	**1.4 J**	<0.43	**0.83 J**
Perfluorooctanesulfonic acid	**PFOS**	**1.3 JI**	**47 I**	<5	**8.7 B**	**120**	<5	**160**	**1.1 J**	**0.83 J**	**3.5**	<0.44
Perfluorooctanoic acid	**PFOA**	**2.8**	**7**	**32**	**2.3**	**470**	<5	**1.8**	**0.85 J**	**1.4 J**	**1.0 J**	**0.47 J**
Perfluoropentanoic acid	PFPeA	<0.47	**2.5**	<5	<0.43	**150**	<5	**1.0 J**	**0.43 J**	**0.54 J**	<0.43	<0.44
Perfluorotetradecanoic acid	PFTeDA	<0.47	<0.52	<5	<0.43	<0.43	<5	<0.44	<0.41	<0.42	<0.43	<0.44
Perfluorotridecanoic acid	PFTrDA	<0.47	<0.52	<5	<0.43	<0.43	<5	<0.44	<0.41	<0.42	<0.43	<0.44
Perfluoroundecanoic acid	PFUnA	<0.47	**0.58 J**	<5	<0.43	<0.43	<5	<0.44	<0.41	<0.42	<0.43	<0.44

J (or G, X, or I) Estimated value $\geq$ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)